



Power Tools

Model 1716-3
Ser # C060083

PM-1907

Date: 10-15-58

1600 and 1700 RADIAL DRILLS

SETTING UP THE MACHINE

Having removed the machine from the packing case, place the table and column assembly on the floor stand or bench where it is to be used. Untie clamp lock and slide it in position so as to allow free movement of the arm. The drill head and arm assembly should be slid into position in the cradle. When placing the arm assembly, care should be taken to prevent jarring the ball bearings in the cradle. Guide the arm carefully being sure that it is properly seated and that it slides freely. The stop block located on the back end of the arm should then be turned down to prevent withdrawal of the arm in operation. Insert raising blocks under each corner of frame. The table should now be leveled using shims between the frame and stand; the machine will then be ready for use.

ELEVATING SCREW

The elevating crank operates a pair of bevel gears which in turn cause the elevating screw to raise or lower the arm and drill head. This assembly is carefully made and tested before shipment, but if knocked or jarred during shipment it may be misaligned. This misalignment will cause the crank to operate stiffly and impose an unnecessary strain on the gears. The trouble can be eliminated simply by loosening the nut on top of the elevating screw and turning the crank until the screw aligns itself. Then tighten the nut securely after correct alignment has been attained. **DO NOT FORCE THE ELEVATING CRANK.**

BELT TENSION

Belt tension may be varied by moving the belt housing after loosening the two bolts which secure it to the head casting. Do not tighten belt too much as needless tension will cause undue wear on both the motor and drill press pulley bearings.

TO REMOVE AND REPLACE BELT

The drive belt is easily replaced as follows:

1. Remove three hex head screws and lockwashers holding upper bearing holder to head. This will permit the upper bearing holder to be withdrawn from top bearing on pulley.

2. Loosen lock handle on left hand side of jackshaft

and move jackshaft bearing unit forward.

3. Lower quill assembly approximately four inches and lock with quill locking handle.

4. The old belt may now be slipped under lower pulley on bearing unit and then over top of spindle pulley.

5. New belt is installed by reversing these instructions.

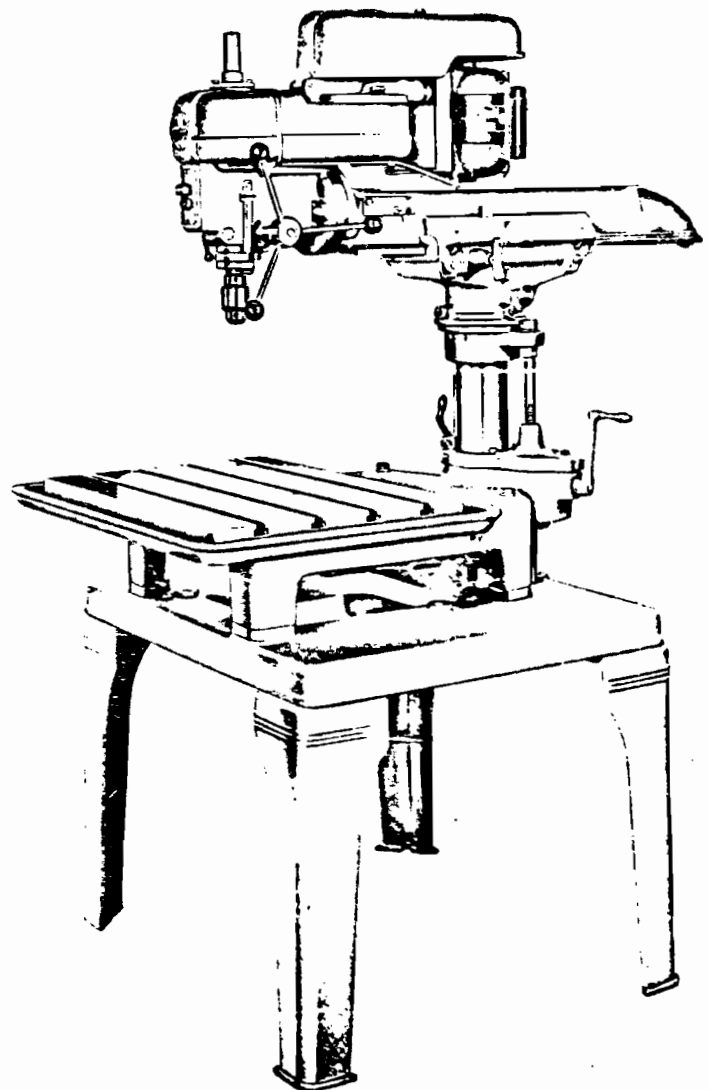


Fig. 1

REMOVING THE CHUCK

Located on the spindle directly above the chuck is a lock nut which is part of chuck. Screwing this nut down on the chuck will force it off the taper on end of spindle

without damage. A spanner wrench is furnished with the machine, use spanner wrench to turn lock nut and end of chuck wrench handle to hold spindle from turning. Always be sure that taper on spindle and socket in chuck are clean before replacing chuck on spindle, then tighten lock nut.

REMOVING SPINDLE AND QUILL ASSEMBLY

To take out — Remove depth gauge adjusting nuts from graduated depth rod. Grasp spindle nose with left hand to prevent it from falling, and turn hand feed wheel until spindle and quill assembly comes right down out of head casting, keep holding hand feed handle and allow it to turn back slowly, counting number of revolutions, until tension is out of return spring. Do not let it spin back to "neutral" as momentum will break spring when it reaches zero tension.

To put in — Using right hand, turn feed wheel as if feeding spindle down - winding up spring the same number of revolutions as counted above, or vary as necessary to get smooth return without banging at end of travel. Insert spindle and quill assembly with left hand, to engage feed pinion gear; it may be necessary to rotate spindle slightly to engage splines in pulley. Allow spindle to rise to normal return position. Put depth gauge adjusting nuts back on depth gauge.

ADJUSTMENT TO COMPENSATE FOR WEAR BETWEEN QUILL AND HEAD

On six inch spindle travel models only, after considerable use, play may develop between quill and drill press head due to wear.

To adjust:

1. Remove the two screws, SP-509, and washers 240-49 (Fig. 3).
2. Tighten quill lock screws 204-11 against plugs. It will not be necessary to tighten these screws too much.
3. Turn pilot wheel to test movement of quill and play. If there is a slight "drag" quill lock screws have been adjusted too tight, back off lock screws with very little turn.
4. If quill still has play, turn lock screws slightly tighter.
5. After proper adjustment has been made, replace screws and washers.

On six inch spindle travel models there is a calibrated depth indicator.

This depth indicator is located next to the spring housing on the left side of drill press head. Each division is equal to 1/32 inch spindle travel. To set the vernier, loosen nut and turn vernier until zero mark matches a line on the spring housing and retighten nut. Hole can then be drilled to exact depth.

TO REMOVE SPINDLE PULLEY FROM HEAD

Follow instructions for removing belt and for removing quill assembly, then remove hex cap screw and washer, nearest to head, that holds jackshaft to head. Then loosen other hex cap screw (do not remove) that holds jackshaft to head and slide jackshaft toward head and remove pulley.

TILTING HEAD

The head of this drill press is adjustable to 45 degrees either side or vertical by loosening the two cap nuts holding the head to the ram. Care should be used to hold the head in position when loosening these nuts to prevent it from tilting suddenly from its own weight. Retighten nuts when head is in desired position.

FOUR ADJUSTING SCREWS

Four adjusting screws bear on brass plugs to provide extra snug fit between cradle and column.

DRILL HEAD LUBRICATION

Complete lubrication of the pulley and spindle bearings is affected by applying oil through the ball oiler on top of the spindle cap, the oil will run down the spindle lubricating the ball bearings. DO NOT OVER LUBRICATE.

GENERAL LUBRICATION

The arm cradle must be kept well lubricated to insure freedom of operation, an oil cup located on the side of the cradle should be kept filled with lubricating oil. The column and the guide key should be oiled occasionally. All other moving parts such as lock handles, feed handles, elevating crank and screw will function better if occasionally lubricated with a few drops of oil.

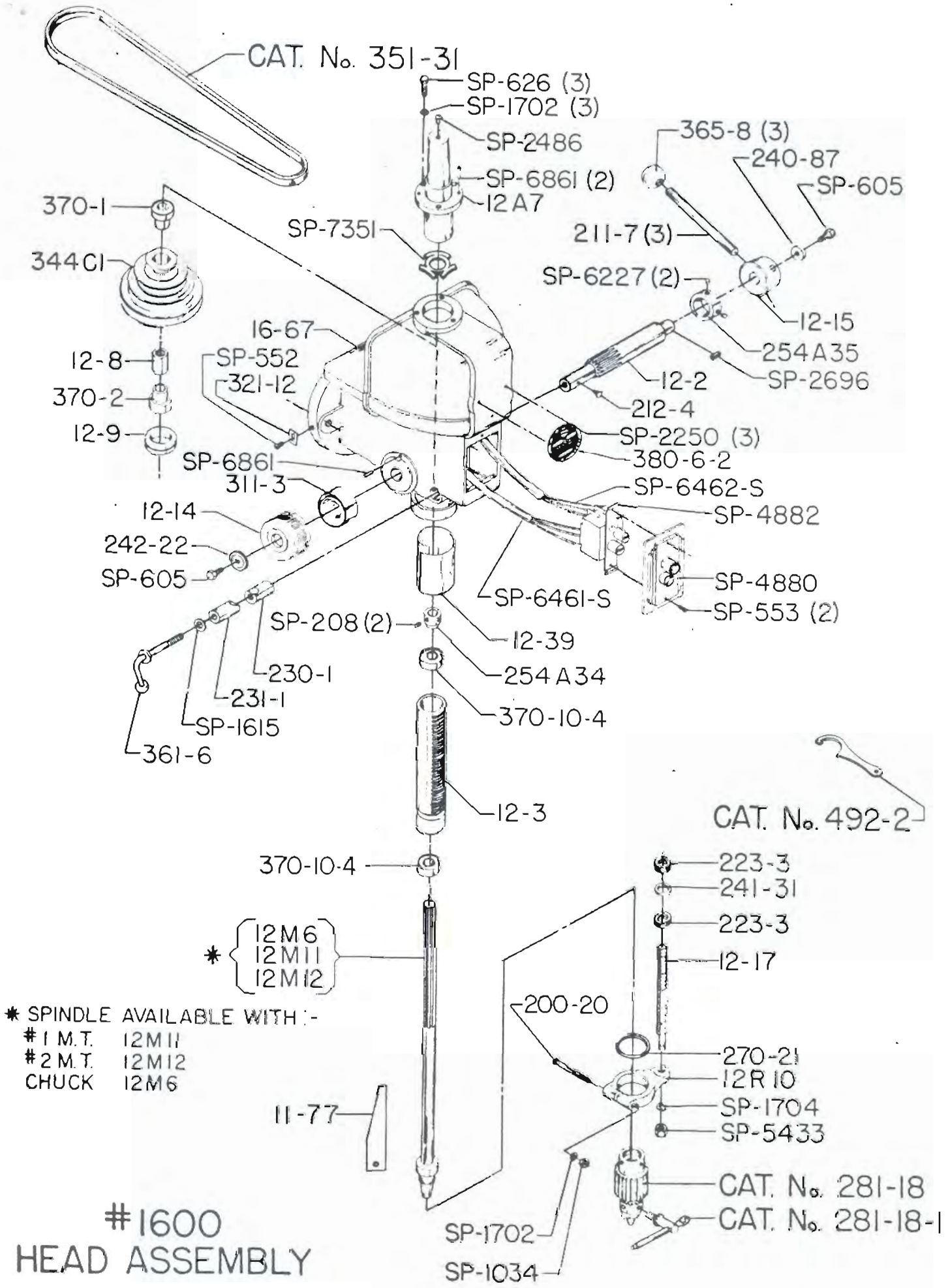


Figure 2

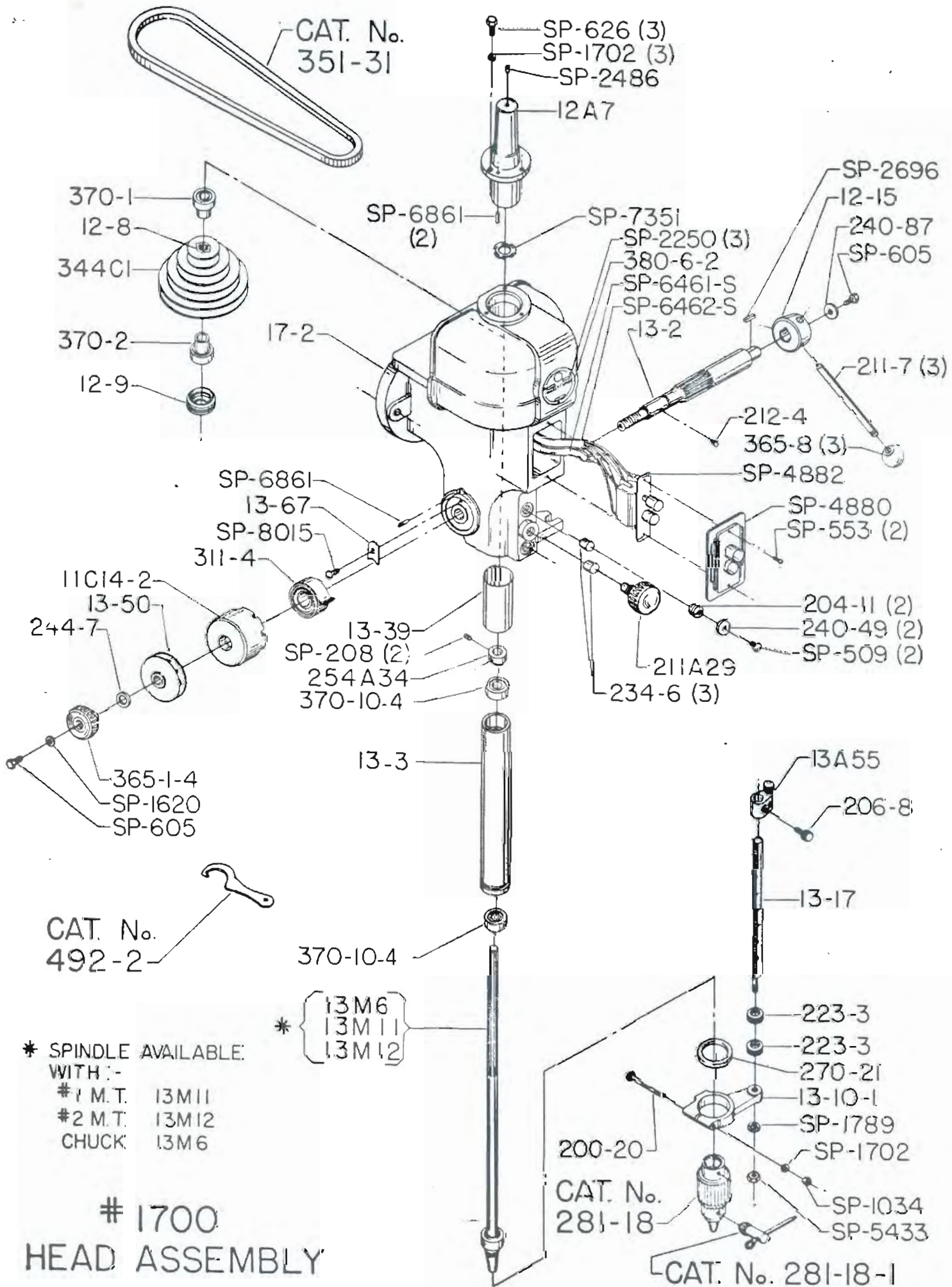


Figure 3

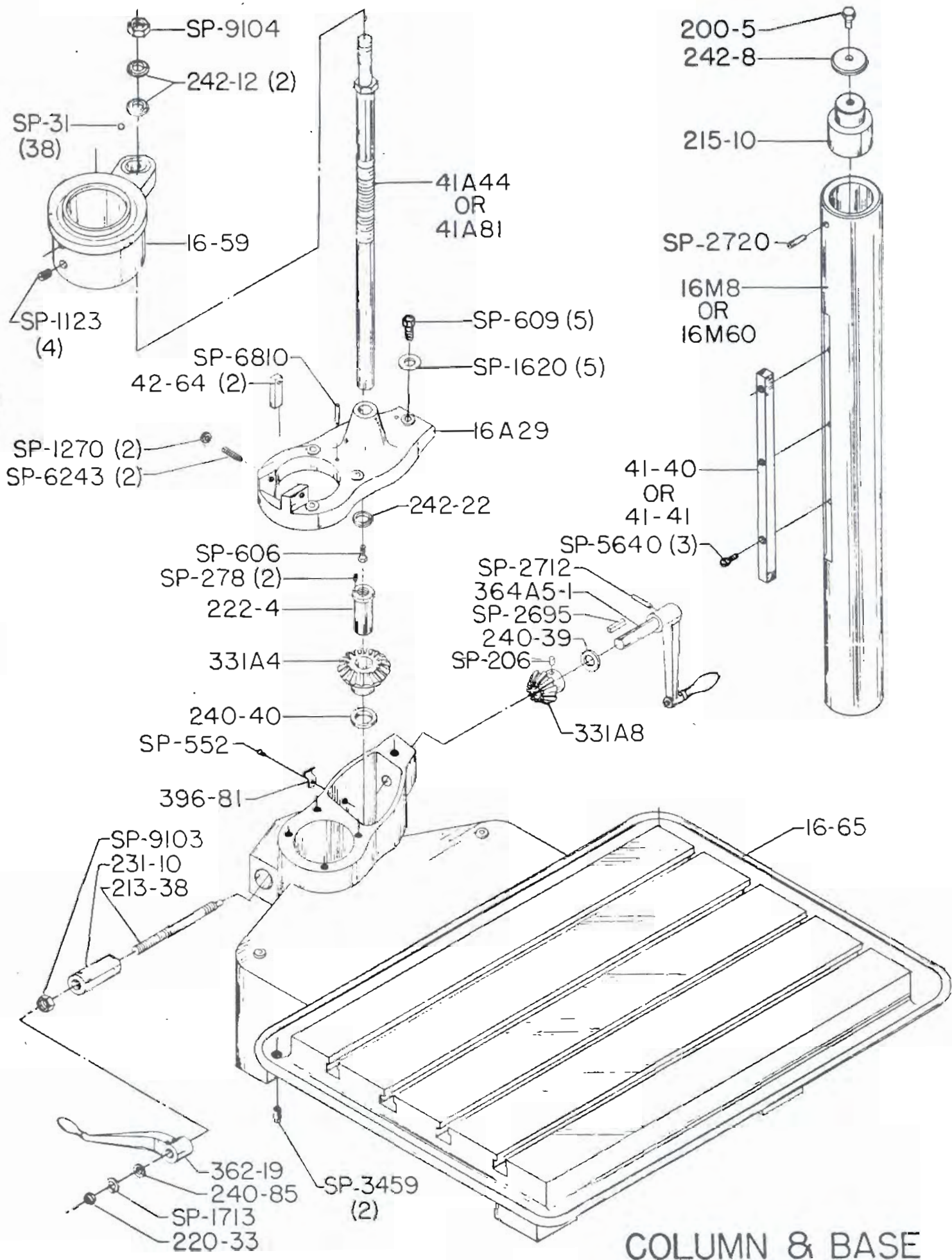
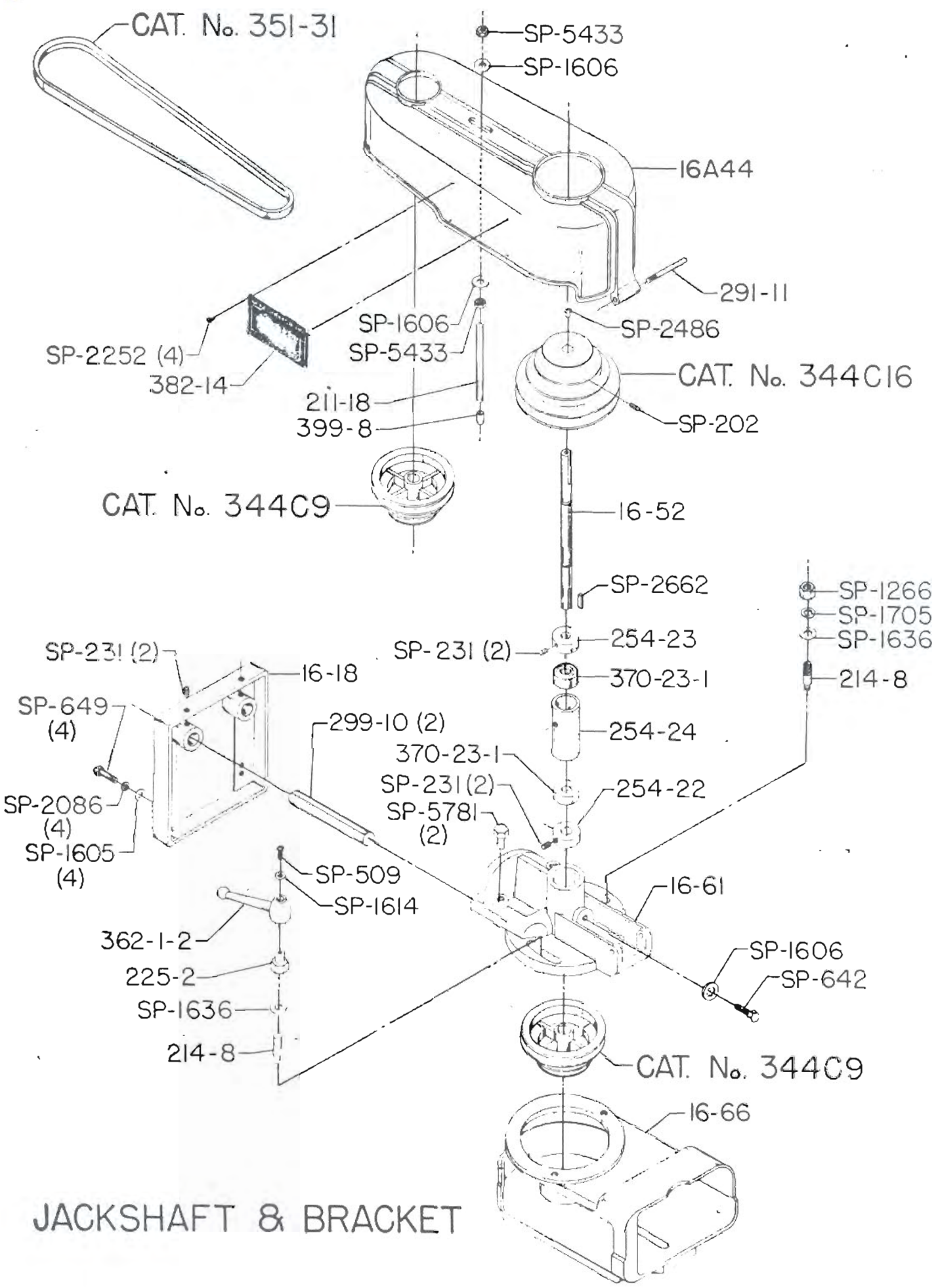
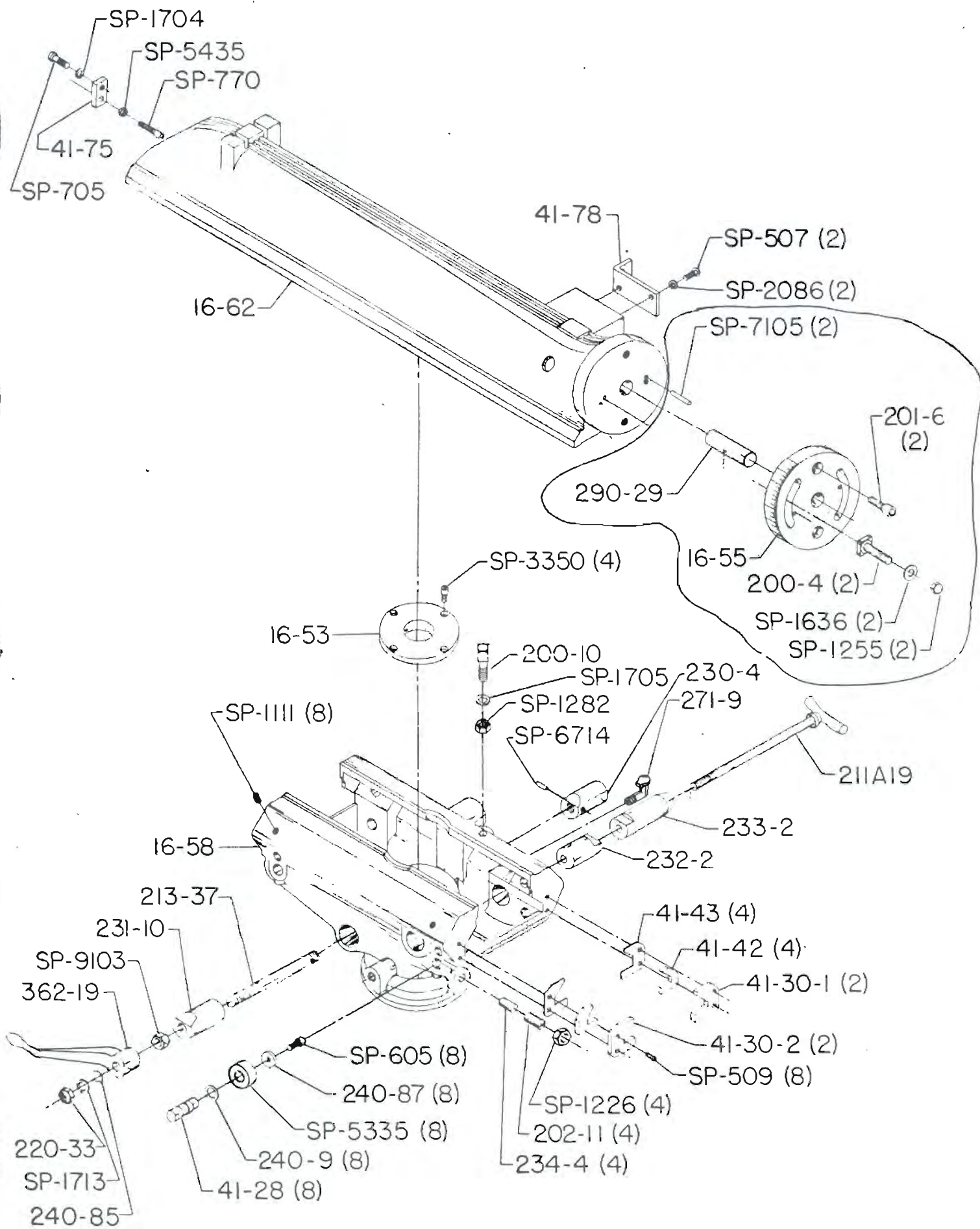


Figure 4



JACKSHAFT & BRACKET

Figure 3



RAM & CRADLE

Figure 6

Table 1. REPLACEMENT PARTS

IMPORTANT. Give both the Part Number and the Description of each item when ordering from this list;
also the Serial Number of the machine on which the parts are to be used.

| Part No. | Description | Part No. | Description |
|---------------------------------------|--|---------------------------------------|--|
| 1600 Head Assembly (4" Travel) | | 1700 Head Assembly (6" Travel) | |
| 11-77 | Drift Key | SP-1702 | 1/4" Lockwasher |
| 12-2 | Pinion | SP-1704 | 3/8" Lockwasher |
| 12-3 | Sleeve | SP-2250 | No. 4 x 3/16" Drive Screw |
| 12M6 | Spindle Shaft and Collar, Chuck Type | SP-2696 | 3/16 x 3/16 x 5/16" Straight Key |
| 12A7 | Top Bearing Holder, Including: SP-2486 Oiler | SP-4880 | Switch Cover |
| 12-9 | Bottom Bearing Holder | SP-4882 | Switch |
| 12R10 | Sleeve Stop Collar, Including: 200-20 Clamp Bolt | SP-5433 | 3/8-16" Hex. Jam Nut |
| | SP-1702 1/4" Lockwasher | SP-6461-S | Wire |
| | SP-1034 1/4-20" Hex. Nut | SP-6462-S | Wire |
| 12M11 | Spindle, No. 1 Morse Taper | SP-6861 | 3/16 x 5/8" Groove Pin, No. 1 |
| 12M12 | Spindle, No. 2 Morse Taper | SP-7351 | Bearing Spring Washer |
| 12-14 | Spring Housing | Cat. No. 281-18 | Chuck |
| 12-15 | Hub | Cat. No. 281-18-1 | Chuck Key |
| 12-17 | Depth Gauge | Cat. No. 351-31 | V-Belt |
| 12-39 | Sleeve, Oil Splash Guard | Cat. No. 492-2 | Spanner Wrench |
| 16-67 | Head Casting | | |
| 211-7 | Spoke | | |
| 212-4 | Spring Pin | | |
| 223-3 | Depth Gauge Stop Nut | | |
| 230-1 | Locking Plug | | |
| 231-1 | Locking Plug | | |
| 240-87 | Washer | | |
| 241-31 | Spacer | | |
| 242-22 | Washer | | |
| 254A34 | Collar, Including: SP-208 1/4-20 x 1/2" Set Screw | | |
| 254A35 | Collar, Including: SP-6227 1/4-20 x 3/15" Drive Screw | | |
| 270-21 | "O" Ring | | |
| 311-3 | Return Spring | | |
| 321-12 | Pointer | | |
| 344C1 | Pulley, Including: 12-18 Insert | | |
| | 370-1 Bearing | | |
| | 370-2 Bearing | | |
| 361-6 | Locking Handle | | |
| 365-8 | Knob | | |
| 370-10-4 | Bearing | | |
| 380-6-2 | Name Plate | | |
| SP-552 | No. 10-32 x 5/16" Rd. Hd. Screw | | |
| SP-553 | No. 6-32 x 1/2" Rd. Hd. Screw | | |
| SP-605 | 5/16-18 x 1/2" Hex. Hd. Bolt | | |
| SP-626 | 1/4-20 x 3/4" Hex. Hd. Screw | | |
| SP-1615 | 3/8" Washer | | |
| | | 11C14-2 | Spring Housing |
| | | 12A7 | Top Bearing Holder, Including: SP-2486 Oiler |
| | | 12-9 | Bottom Bearing Holder |
| | | 12-15 | Hub |
| | | 13-2 | Pinion |
| | | 13-3 | Sleeve (Quill) |
| | | 13M6 | Spindle (Chuck Type) |
| | | 13-10-1 | Quill Stop Collar |
| | | 13M11 | Spindle, No. 1 Morse Taper |
| | | 13M12 | Spindle, No. 2 Morse Taper |
| | | 13-17 | Depth Gauge |
| | | 13-39 | Oil Splash Guard Sleeve |
| | | 13-50 | Depth Vernier |
| | | 13A55 | Depth Stop |
| | | 13-67 | Pinion Retainer |
| | | 17-2 | Head |
| | | 200-20 | Clamp Bolt |
| | | 204-11 | Quill Adjusting Screw |
| | | 206-8 | Hand Screw |
| | | 211-7 | Spoke |
| | | 211A29 | Hand Knob and Stud |
| | | 212-4 | Spring Pin |
| | | 223-3 | Depth Gauge Stop Nut |
| | | 234-6 | Plug |
| | | 240-49 | Washer |
| | | 240-87 | Washer |
| | | 244-7 | "D" Washer |
| | | 254A34 | Collar, Including: SP-208 1/4-20 x 1/2" Set Screw |

PARTS LIST (Continued)

| Part No. | Description | Part No. | Description |
|-------------------|--|----------|-----------------------------------|
| 270-21 | "O" Ring | 220-33 | 5/8-11" Flexloc Hex. Nut |
| 311-4 | Return Spring | 231-10 | Locking Block |
| 344C1 | Pulley, Including: | 240-39 | Washer |
| | 12-8 Insert | 240-40 | Washer |
| | 370-1 Bearing | 240-85 | Washer |
| | 370-2 Bearing | 242-8 | Flange Washer |
| 365-1-4 | Hand Knob | 242-12 | Flange Washer |
| 365-8 | Knob | 242-22 | Washer |
| 370-10-4 | Bearing | 331A4 | Gear, Including: |
| 380-6-2 | Name Plate | | 222-4 Bushing |
| SP-509 | 1/4-20 x 1/2" Rd. Hd. Screw | | SP-278 No. 10-32 x 1/2" Set Screw |
| SP-553 | No. 6-32 x 1/2" Rd. Hd. Screw | 331A8 | Bevel Gear, Including: |
| SP-605 | 5/16-18 x 1/2" Hex. Hd. Bolt | | SP-206 5/16-18 x 5/16" Set Screw |
| SP-626 | 1/4-20 x 3/4" Hex. Hd. Screw | 362-19 | Locking Handle |
| SP-1034 | 1/4-20" Hex. Nut | 364A5-1 | Crank |
| SP-1620 | 5/16" Straight Washer | 396-81 | Cable Clip |
| SP-1702 | 1/4" Lockwasher | SP-31 | 3/8" Dia. Bearing Ball |
| SP-1789 | 3/8" Int. Tooth Lockwasher | SP-552 | No. 10-32 x 5/16" Rd. Hd. Screw |
| SP-2250 | No. 4 x 3/16" Drive Screw | SP-606 | 5/16-18 x 5/8" Hex. Hd. Screw |
| SP-2696 | 3/16 x 3/16 x 5/16" Straight Key | SP-609 | 5/16-18 x 1 1/2" Hex. Hd. Screw |
| SP-4880 | Switch Cover | SP-1123 | 1/2-13 x 5/8" Set Screw |
| SP-4882 | Switch | SP-1270 | 3/8-24" Hex. Jam Nut |
| SP-5433 | 3/8-16 Hex. Jam Nut | SP-1620 | 5/16" Straight Washer |
| SP-6461-S | Wire | SP-1713 | 5/8" Lockwasher |
| SP-6462-S | Wire | SP-2712 | 1/4 x 1 1/4" Roll Pin |
| SP-6861 | 3/16 x 5/8" Groove Pin, No. 1 | SP-2695 | 3/16 x 3/16 x 1" Straight Key |
| SP-7351 | Bearing Spring Washer | SP-3459 | 1/2" Pipe Plug |
| SP-8015 | 1/4-20 x 1/2" Button Head Soc. Cap Screw | SP-5640 | 5/16-24 x 5/8" Fil. Hd. Screw |
| Cat. No. 281-18 | Chuck | SP-6243 | 3/8-24 x 1 1/4" Set Screw |
| Cat. No. 281-18-1 | Chuck Key | SP-6810 | 1/4 x 1" Groove Pin, No. 1 |
| Cat. No. 351-31 | V-Belt | SP-9103 | 5/8-11" Hex. Jam Nut |
| Cat. No. 492-2 | Spanner Wrench | SP-9104 | 3/4-16" Hex. Nut |

Column and Base

| | |
|--------|--|
| 16M8 | 42" Column, Including: |
| | 215-10 Alignment Pin |
| | SP-2720 1/4 x 1" Roll Pin |
| 16A29 | Gear Housing Cover with Guide Key Scr. |
| 16-59 | Column Collar |
| 16M60 | 30" Column, Including: |
| | 215-10 Alignment Pin |
| | SP-2720 1/4 x 1" Roll Pin |
| 16-65 | Base |
| 41-40 | Column Guide Key |
| 41-41 | Column Guide Key |
| 41A44 | Raising and Lowering Screw (short) |
| 41A81 | Raising and Lowering Screw (long) |
| 42-64 | Key Block |
| 200-5 | Hex. Hd. Cap Screw |
| 213-38 | Locking Stud |

Jacksaft and Bracket

| | |
|--------|-----------------------------------|
| 16-18 | Motor Plate |
| 16A44 | Guard, Including: |
| | 211-18 Stud |
| | 382-14 Speed Chart |
| | 399-8 Bumper |
| | SP-1606 3/8" Steel Washer |
| | SP-2252 No. 2 x 3/16" Drive Screw |
| | SP-5433 3/3-16" Hex. Jam Nut |
| 16-52 | Spindle |
| 16-61 | Bracket |
| 16-66 | Bracket |
| 214-3 | Stud |
| 225-2 | Lock Nut |
| 254-22 | Collar |
| 254-23 | Collar |
| 254-24 | Spacer |

PARTS LIST (Continued)

| Part No. | Description | Part No. | Description |
|-----------------------|---------------------------------------|----------|---|
| SP-231 | 5/16-18 x 3/8" Set Screw | 213-37 | Lock Stud |
| SP-509 | 1/4-20 x 1/2" Rd. Hd. Screw | 220-33 | 5/8-11" Flexloc Hex. Nut |
| SP-642 | 3/8-16 x 1" Hex. Hd. Screw | 230-4 | Lock Plug |
| SP-649 | 5/16-18 x 1" Hex. Cap Screw | 231-10 | Locking Block |
| SP-1266 | 1/2-13" Hex. Jam Nut | 232-2 | Locking Plug |
| SP-1605 | 5/16" Steel Washer | 233-2 | Locking Plug |
| SP-1606 | 3/8" Steel Washer | 234-4 | Brass Plug |
| SP-1614 | 1/4" Steel Washer | 240-9 | Spacer |
| SP-1636 | 1/2" Steel Washer | 240-85 | Washer |
| SP-1705 | 1/2" Lockwasher | 240-87 | Washer |
| SP-2086 | 5/16" Lockwasher | 271-9 | 90 degree Oil Cup |
| SP-2486 | 1/4" Oiler | 290-29 | Angle Head Guide Pin |
| SP-2662 | 3/16 x 3/16 x 3/4" Straight Key | 362-19 | Locking Handle |
| SP-5781 | 1/2-20 x 3/4" Hex. Cap Screw | SP-507 | 5/16-18 x 3/4" Rd. Hd. Screw |
| Cat. No. 344C9 | Pulley | SP-509 | 1/4-20 x 1/2" Rd. Hd. Screw |
| Cat. No. 344C16 | Pulley, Including: | SP-605 | 5/16-18 x 1/2" Hex. Hd. Bolt |
| | • SP-202 1/4-20 x 1/2" Set Screw .. | SP-705 | 3/8-16 x 1" Fil. Hd. Screw |
| Cat. No. 351-31 | V-Belt | SP-770 | 5/16-18 x 1 1/4" Soc. Hd. Cap Screw |
| | | SP-1111 | 3/8-16 x 3/8" Set Screw |
| | | SP-1226 | 5/8-18" Hex. Jam Nut |
| | | SP-1255 | 1/2-13" Acorn Nut |
| | | SP-1282 | 1/2-13 Hex. Jam Nut |
| | | SP-1636 | 1/2" Steel Washer |
| | | SP-1704 | 3/8" Lockwasher |
| | | SP-1705 | 1/2" Lockwasher |
| | | SP-1713 | 5/8" Lockwasher |
| | | SP-2086 | 5/16" Lockwasher |
| | | SP-3350 | 5/16-18 x 1/2" Soc. Hd. Screw |
| | | SP-5335 | Bearing |
| | | SP-5435 | 5/16-18" Hex. Jam Nut |
| | | SP-6714 | 5/32 x 1 1/4" Roll Pin |
| | | SP-7105 | 1/4 x 1 1/4" Groove Pin, No. 1 |
| | | SP-9103 | 5/8-11" Hex. Jam Nut |
| | | 291-11 | Hinge Pin |
| | | 299-10 | Motor Pin |
| | | 362-1-2 | Handle |
| | | 370-23-1 | Bearing |
| Ram and Cradle | | | |
| 16-53 | Flange | | |
| 16-55 | Cant. Arm Flange | | |
| 16-58 | Cradle | | |
| 16-62 | Cantilever Arm | | |
| 41-28 | Eccentric Stud | | |
| 41-30-1 | Holder (felt) | | |
| 41-30-2 | Holder (felt) | | |
| 41-42 | Felts | | |
| 41-43 | Felt Retainer | | |
| 41-75 | Ram Stop | | |
| 41-78 | Ram Stop | | |
| 200-4 | Angle Head Lock Stud | | |
| 200-10 | Arm Stop | | |
| 201-6 | Soc. Hd. Cap Screw | | |
| 202-11 | Headless Set Screw | | |
| 211A19 | Ram Locking Stud | | |

Replacement parts can be ordered through your Dealer. Always give both the part number and the description of each part when ordering. Also the serial number of the machine on which the parts are to be used. Many of the standard parts such as screws, nuts, washers, etc., are usually available from local Mill Supply or Hardware Dealers.

Standard electrical parts such as switches, condensers, cords and plugs, etc., can be obtained from Local Electrical Supply Dealers or Motor Repair Shops. When ordering refer to manufacturer part number which appears on the part.

Motors are made by leading motor manufacturers whose name also appears on the motor nameplate. These manufacturers are represented by motor service stations throughout the United States and some foreign countries.

The right is reserved to make changes in design or equipment at any time without incurring any obligation to install these on machines previously sold and to discontinue models of machines, motors or accessories at any time without notice.

SPECIAL NOTE ON ALIGNMENT:

(1) Do not attempt to make corrections on the motor feet, as they are dowelled to the motor plate to prevent lateral movement.

(2) The cast iron collar that supports the ram cradle on the column is pinned in position and cannot be moved.

(3) Any "looseness" between the ram and the 8 ball bearing rollers, supporting it in the cradle, can be eliminated by moving the two top bearings on one side only. Adjust by releasing set screws and turning bearing eccentric studs, sliding ram back and forth at same time until wedging action of bearings is snug.



ROCKWELL
MANUFACTURING COMPANY
PITTSBURGH 8, PENNSYLVANIA



DATED IM 8-10-61

RAM-TYPE RADIAL DRILL PRESS

SETTING UP THE MACHINE

Having removed the machine from the packing case, place the table and column assembly on the floor stand or bench where it is to be used. Untie clamp lock and slide it in position so as to allow free movement of the arm. The drill head and arm assembly should be slid into position in the cradle. When placing the arm assembly, care should be taken to prevent jarring the ball bearings in the cradle. Guide the arm carefully being sure that it is properly seated and that it slides freely. The stop block located on the back end of the arm should then be turned down to prevent withdrawal of the arm in operation. Insert raising blocks under each corner of frame. The table should now be leveled using shims between the frame and stand; the machine will then be ready for use.

ELEVATING SCREW

The elevating crank operates a pair of bevel gears which in turn cause the elevating screw to raise or lower the arm and drill head. This assembly is carefully made and tested before shipment, but if knocked or jarred during shipment it may be misaligned. This misalignment will cause the crank to operate stiffly and impose an unnecessary strain on the gears. The trouble can be eliminated simply by loosening the nut on top of the elevating screw and turning the crank until the screw aligns itself. Then tighten the nut securely after correct alignment has been attained. **DO NOT FORCE THE ELEVATING CRANK.**

BELT TENSION

Belt tension may be varied by moving the belt housing after loosening the two bolts which secure it to the head casting. Do not tighten belt too much as the needless tension will cause undue wear on both the motor and drill press pulley bearings.

TO REMOVE AND REPLACE BELT

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1. Remove three hex head screws and lockwashers holding upper bearing holder to head. This will permit the upper bearing holder to be withdrawn from top bearing on pulley.
2. Loosen lock handle on left hand side of jackshaft and move jackshaft bearing unit forward.
3. Lower quill assembly approximately four inches and lock with quill locking handle.

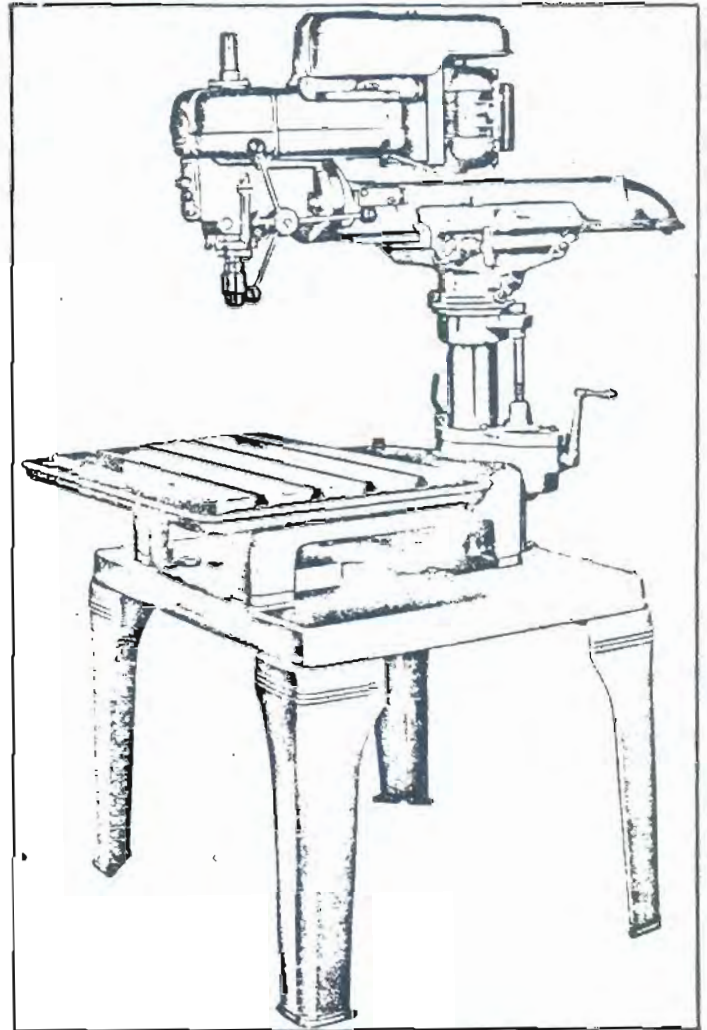


Fig. 1.

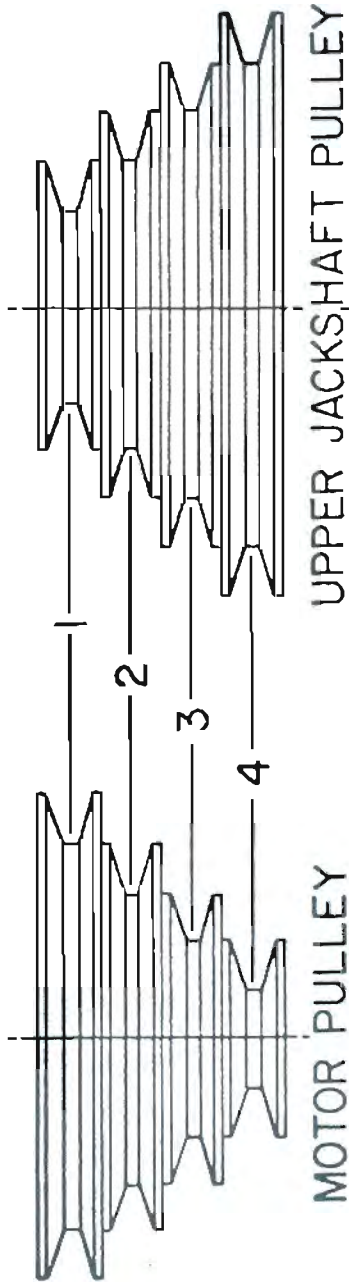
4. The old belt may now be slipped under lower pulley on bearing unit and then over top of spindle pulley.

5. New belt is installed by reversing these instructions.

REMOVING THE CHUCK

Located on the spindle directly above the chuck is a lock nut which is part of chuck. Screwing this nut down on the chuck will force it off the taper on end of spindle without damage. A spanner wrench is furnished with the machine, use spanner wrench to turn lock nut and end of chuck wrench handle to hold spindle from turning. Always be sure that taper on spindle and socket in chuck are clean before replacing chuck on spindle, then tighten lock nut.

SPINDLE SPEEDS



SPINDLE RPM - 1725 RPM MOTOR

| | A | B | C | D |
|---|-------|------|------|------|
| 1 | *8200 | 4000 | 2200 | 1030 |
| 2 | 4750 | 2300 | 1250 | 600 |
| 3 | 2800 | 1380 | 765 | 365 |
| 4 | 1450 | 695 | 380 | 175 |

SPINDLE RPM - 1140 RPM MOTOR

| | A | B | C | D |
|---|------|------|------|-----|
| 1 | 5400 | 2640 | 1450 | 680 |
| 2 | 3130 | 1520 | 825 | 395 |
| 3 | 1850 | 910 | 505 | 240 |
| 4 | 960 | 455 | 250 | 115 |

*8200 RPM RECOMMENDED FOR OCCASIONAL USE ONLY.